RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH

SUBJECT TITLE : DEIMOS

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KEYWORDS : ss, single-cigarette, collection-flask, flow-rate

OBJECTIVE

Develop and evaluate the methodology for single cigarette routine determination of sidestream smoke TPM, nicotine and CO yields.

STATUS

Equipment

A sidestream smoke (SS) collection system based on a four-port Borgwald smoking machine has been designed and developed with the collaboration of the technical department. This SS collection set-up will be operational end of January.

CORESTA Task Force studies

Additional work was done in the context of the CORESTA ETS/SS Task Force. The influence of flow rate on the MS and SS yields and cigarette static burning rate was determined for several SS collection systems.
The study was carried out using the 1R4F Kentucky reference cigarette. The various collection systems investigated included the open "fishtail" collection chamber designed by BAT [1] and the same BAT chamber fitted with a deflector under the cigarette. The air-flow through the chambers varied between 1 and 5 standard liters per minute (slpm).
Results were presented at the Task Force meeting in Geneva, on December 5, and an internal report was issued [2]. The following conclusions were made :
The original design of the BAT chamber, which provides a very narrow body, allows an efficient clearing of the SS smoke from the burning cigarette at relatively low flow rates (- 2 slpm). This is a prerequisite for maintaining the MS yields at their free-smoking value. The air velocity around the cigarette is however very high and the smoking is not performed according to

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the ISO norm [3] even when operating at low flow rates (2 slpm) where losses of smoke through the opening underneath the flask becomes a problem. The static burning rate is also significantly altered. The use of a deflector that directs the air flow away from the cigarette is a possible way to obviate these problems.

PLANS

- Set up and test the new 4-port smoking equipment.
- Subcontract a study of the distribution of air velocities in the SS collection chamber by computer flow modelling in order to optimize its geometry.
- Continue work on chamber design within the CORESTA Task Force.

REFERENCES

[1] Proctor-C.J., Martin-C., Beven-J.L. and Dymond-H.F., Evaluation of an apparatus designed for the collection of sidestream tobacco smoke, Analyst 113 (1988), 1509-13.
[2] Bindler-G.N. and Piadé-J.J., Effects of flow rate within a SS collection device, December 2, 1988.
[3] Tobacco and tobacco products - Routine analytical cigarette smoking machine - Definitions, standard conditions and auxiliary equipment, ISO 3308 2nd Ed. 1986.

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